



# HITACHI SERVICE MANUAL

TY

No.452E

**TRK-W22**

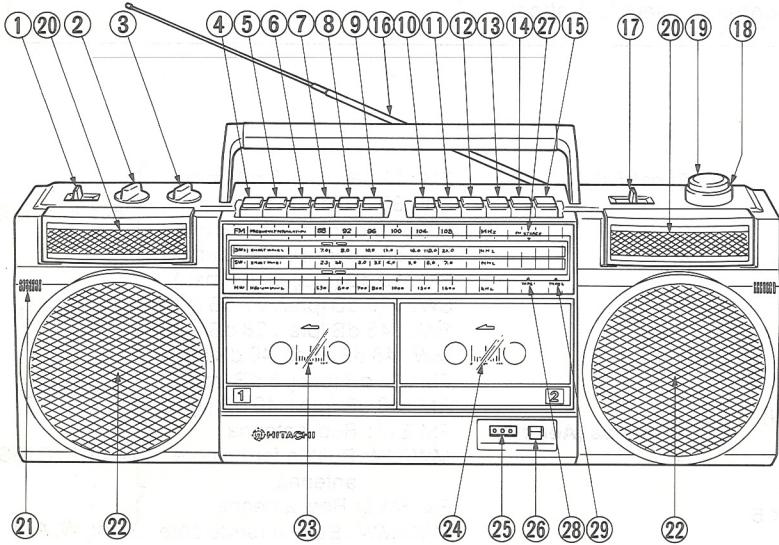
H, HC, E, E(BS), W, AU

TN-33ZVC-681 Chassis

TN-33ZVC-682 Chassis

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## KEY TO ILLUSTRATIONS

① FUNCTION SELECTOR	⑬ ROD ANTENNA
② TONE CONTROL	⑭ BAND SELECTOR
③ VOLUME CONTROL	⑮ TUNING CONTROL
<b>TAPE 1</b>	⑯ FINE TUNING CONTROL (W, AU only)
④ PAUSE BUTTON	⑰ 2 cm TWEETER
⑤ STOP/EJECT BUTTON	⑱ INNER MICROPHONE (MONAURAL)
⑥ FAST FORWARD BUTTON	⑲ 10 cm SPEAKER
⑦ REWIND BUTTON	⑳ TAPE 1 CASSETTE HOLDER
⑧ PLAYBACK BUTTON	㉑ TAPE 2 CASSETTE HOLDER
⑨ CONTINUOUS PLAY BUTTON	㉒ TAPE COUNTER
<b>TAPE 2</b>	㉓ COUNTER RESET BUTTON
⑩ PAUSE BUTTON	㉔ FM STEREO INDICATOR
⑪ STOP/EJECT BUTTON	㉕ TAPE 1 INDICATOR
⑫ FAST FORWARD BUTTON	㉖ TAPE 2 INDICATOR
⑬ REWIND BUTTON	
⑭ PLAYBACK BUTTON	
⑮ RECORD BUTTON	

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT.

**RADIO/DOUBLE CASSETTE TAPE RECORDER**

May 1985

**TOYOKAWA WORKS**

**SAFETY PRECAUTION**

The following precautions should be observed when servicing.

1. Since many parts in the unit have special safety-related characteristics, always use genuine Hitachi's replacement parts. Especially critical parts in the power circuit block should not be replaced with other makes. Critical parts are marked with  $\Delta$  in the circuit diagram and printed wiring board.
2. Before returning a repaired unit to the customer, the service technician must thoroughly test the unit to ascertain that it is completely safe to operate without danger of electrical shock.

**SPECIFICATIONS**

<b>General Section</b>		<b>Sensitivity</b>	
<b>Semiconductors</b>		FM : 12 dB (pra.), 3 dB (max.) SW : 30 dB (pra.), 20 dB (max.) MW : 48 dB (pra.), 40 dB (max.) LW : 55 dB (pra.), 48 dB (max.)	{ [For E, E (BS)] }
	ICs : 4 Transistors : 10 [For E] 9 [For E (BS), W, (AU)] 8 [For H, HC]	FM : 12 dB (pra.), 3 dB (max.) SW2 : 30 dB (pra.), 27 dB (max.) SW1 : 45 dB (pra.), 38 dB (max.) MW : 48 dB (pra.), 40 dB (max.)	{ [For W, AU] }
	Diodes : 16 [For W] 15 [Except W]	FM : 12 dB (pra.), 3 dB (max.) AM : 48 dB (pra.), 40 dB (max.)	{ [For H, HC] }
	LEDs : 3	FM/SW : Rod antenna MW/LW : Built-in ferrite core antenna	{ [For E, E (BS)] }
<b>Power supply</b>	AC : 220 V, 50 Hz [For E] AC : 240 V, 50 Hz [For E (BS), AU] AC : 110–127 V/200–220 V 230–250 V, 50/60 Hz [For W] AC : 120 V 60 Hz [For H, HC] DC : 9 V ("D" CELL or IEC R20 $\times$ 6 or equivalent)	FM/SW2 : Rod antenna SW1/MW : Built-in ferrite core antenna FM : Rod antenna AM : Built-in ferrite core antenna	{ [For W, AU] }
<b>Power Consumption</b>	16 W		
<b>Power Output</b>	9 W P.M.P. (AC operation) 6 W M.P.O. (AC operation) 2 W/CH (T.H.D. 10 % DC)		{ [For H, HC] }
<b>Speakers</b>	Woofer : 10 cm, 4 ohms $\times$ 2 Tweeter : 2 cm, 300 ohms $\times$ 2		
<b>Dimensions</b>	570(W) $\times$ 208(H) $\times$ 132(D) mm		
<b>Weight</b>	4.3 kg (with batteries)		
<b>Radio Section</b>			
<b>Circuit System</b>	FM/SW/MW/LW 4-band [For E, E (BS)] FM/SW2/SW1/MW 4-band [For W, AU] FM/AM 2-band [For H, HC]	<b>Tape Recorder Section</b>	
<b>Tuning Range</b>	Superheterodyne FM : 87.5 to 108 MHz SW : 6 to 18 MHz MW : 530 to 1,605 kHz LW : 150 to 285 kHz	Tape	Cassette tape (C-30, 60, 90)
		Track System	4 track 2 channel stereo
		Recording System	AC bias, 55 kHz
		Erasing System	DC erase
		Frequency Response	Normal : 60 to 10,000 Hz
		Signal to Noise Ratio	40 dB
		Wow and Flutter	0.25 % (WRMS)
		Cross Talk	Between tracks : 65 dB Between channels : 40 dB
<b>Intermediate Frequency</b>	FM : 10.7 MHz AM : 465 kHz [For E, E (BS)] AM : 455 kHz [For W, AU, H, HC]	<b>Input Sensitivity and Impedance</b>	Mic : 0.6 mV, 1.2 kohms Line-in : 500 mV, 330 kohms
		<b>Output Load Impedance</b>	Headphone : 8 ohms-100 ohms
		<b>Distortion</b>	3 %
		<b>Erasing Ratio</b>	60 dB
		<b>Fast Forwarding or Rewinding time</b>	110 sec (using C-60)
		<b>Motor</b>	DC motor
		<b>Heads</b>	Permalloy

## DISASSEMBLY

### 1. Cassette lid Removal (Fig. 1)

Insert a screw driver (—) in the direction of arrow to remove the claw.

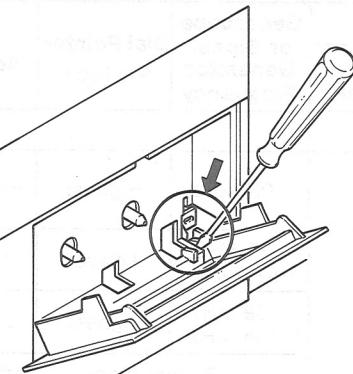


Fig. 1

### 2. Rear Case Removal (Fig. 2, 3)

(1) Remove the battery lid.

(2) The rear case can be removed by removing 8 screws (A). Remove pin connectors P101 of the Tuner P.W.B. and PL601 of the Power P.W.B. at that time.

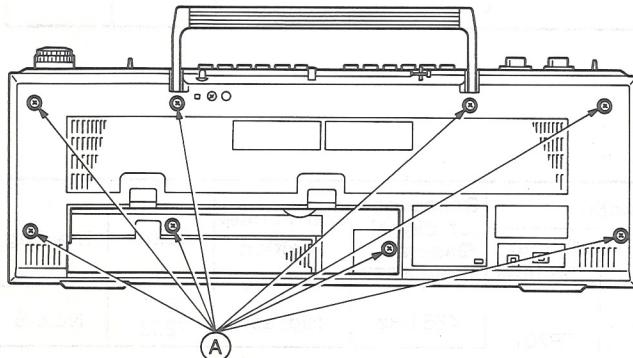


Fig. 2

### 3. Tuner P.W.B. Removal (Fig. 3)

Remove the fixing screw (B) and pull the Tuner P.W.B. toward you out of 2 guide pins.

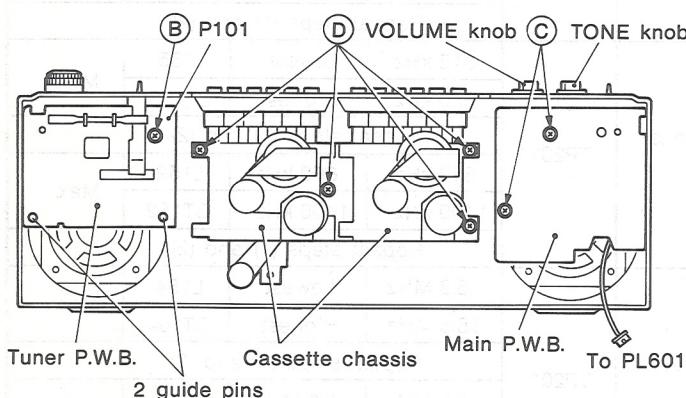


Fig. 3

### 4. Main P.W.B. Removal (Fig. 3)

(1) Pull out the TONE, VOLUME knobs.

(2) Remove 2 fixing screws (C) and the Main P.W.B. is removed when the terminals (LINE IN, EXT MIC, PHONES) and switches (INN MIC, SP, FM MODE, RIF) are pulled out of the front case.

### 5. Cassette chassis (TAPE 1 and TAPE 2) Removal (Fig. 3)

The cassette chassis (TAPE 1 and TAPE 2) are removed while they are assembled together by removing 4 screws (D).

### 6. Speaker Removal (Fig. 4)

Remove 4 fixing screws (E) after the Tuner P.W.B. and Main P.W.B. are removed.

### 7. Power P.W.B. Removal (Fig. 5)

Remove 2 screws (F) and pull out the Power P.W.B. toward the front.

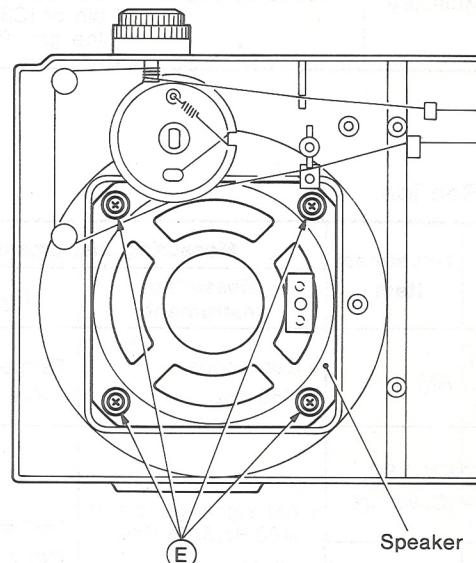


Fig. 4

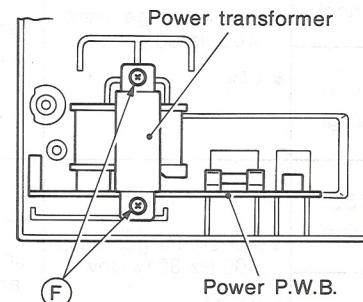


Fig. 5

## ADJUSTMENT

## 1. Radio Section

## FM Section

\* ( ) For W. Germany

Step	Adjustment Item	Measuring Instrument and Connection			Genescope or Signal Generator Frequency	Dial Pointer Position	Adjust	Reading
		Measuring Instrument	Input Terminal	Output Terminal				
1	(1) FM IF	Turn T202 fully counterclockwise.						
	(2) S-Curve	● Genescope (10.7 MHz)	TP102	TP201	10.7 MHz	Highest	T101	Note 1
2	(1)					87 MHz *(87.5 MHz)	Lowest	L102
	(2)	FM OSC (Covering)	TP101 (thru FM dummy antenna) ● Oscilloscope (Note 3)	TP201	109 MHz *(108 MHz)	Highest	CT102	Max.
	(3)							
3	(1)	FM ANT. (Tracking)	● VTVM		90 MHz 106 MHz	90 MHz 106 MHz	L101 CT101	Max.
	(2)							
	(3)				Repeat steps (1) and (2)			
4	(1)	FM MPX. (Multiplex)	● Frequency counter	TP301	—	—	RT301	19 kHz ± 20 Hz (Note 4)

## AM Section

Step	Adjustment Item	Measuring Instrument and Connection			Genescope or Signal Generator Frequency	Dial Pointer Position	Adjust	Reading
		Measuring Instrument	Input Terminal	Output Terminal				
1	(1)	AM IF	● Genescope (465 kHz)	Ferrite-core antenna (Note 5)	TP201	465 kHz	Highest	T201
	(2)					T203 Repeat step (1)		
2	(1)	LW OSC. (Covering)	● AM signal generator (400 Hz, 30 % Dev.)	Ferrite-core antenna (Note 5)	TP201	145 kHz	Lowest	L156
	(2)					290 kHz	Highest	CT156
	(3)					Repeat steps (1) and (2)		
3	(1)	LW ANT. (Tracking)	● VTVM		TP201	160 kHz	160 kHz	L153
	(2)					270 kHz	270 kHz	CT153
	(3)					Repeat steps (1) and (2)		
4	(1)	MW OSC. (Covering)	● AM signal generator (400 Hz, 30 % Dev.)	Ferrite-core antenna (Note 5)	TP201	515 kHz	Lowest	L155
	(2)					1650 kHz	Highest	CT155
	(3)					Repeat steps (1) and (2)		
5	(1)	MW ANT. (Tracking)	● VTVM		TP201	600 kHz	600 kHz	L152
	(2)					1400 kHz	1400 kHz	CT152
	(3)					Repeat steps (1) and (2)		
6	(1)	SW OSC. (Covering)	● AM signal generator (400 Hz, 30 % Dev.)	TP101 (thru SW. dummy antenna)	TP201	5.8 MHz	Lowest	L154
	(2)					18.5 MHz	Highest	CT154
	(3)					Repeat steps (1) and (2)		
7	(1)	SW ANT. (Tracking)	● VTVM	(Note 7)	TP201	6.5 MHz	6.5 MHz	L151
	(2)					16 MHz	16 MHz	CT151
	(3)					Repeat steps (1) and (2)		

Step	Adjustment Item	Measuring Instrument and Connection			Genescope or Signal Generator Frequency	Dial Pointer Position	Adjust	Reading	
		Measuring Instrument	Input Terminal	Output Terminal					
8	(1) (2)	AM IF	● Genescope (455 kHz)	Ferrite-core antenna (Note 5)	TP201	455 kHz	Highest	T201 T203	Note 6
						Repeat step (1)			
9	(1) (2) (3)	MW OSC. (Covering)	● AM signal generator (400 Hz, 30 % Dev.) ● VTVM	Ferrite-core antenna (Note 5)	TP201	515 kHz	Lowest	L156	Max.
						1650 kHz	Highest	CT156	
						Repeat steps (1) and (2)			
10	(1) (2) (3)	MW ANT. (Tracking)				600 kHz	600 kHz	L153	Max.
						1400 kHz	1400 kHz	CT153	
						Repeat steps (1) and (2)			
11	(1) (2) (3)	SW 1 OSC. (Covering)	● AM signal generator (400 Hz, 30 % Dev.) ● VTVM	TP101 (thru SW. dummy antenna) (Note 7)	TP201	2.2 MHz	Lowest	L155	Max.
						7.3 MHz	Highest	CT155	
						Repeat steps (1) and (2)			
12	(1) (2) (3)	SW 1 ANT. (Tracking)				2.7 MHz	2.7 MHz	L152	Max.
						6.3 MHz	6.3 MHz	CT152	
						Repeat steps (1) and (2)			
13	(1) (2) (3)	SW 2 OSC. (Covering)	● AM signal generator (400 Hz, 30 % Dev.) ● VTVM	TP101 (thru SW. dummy antenna) (Note 7)	TP201	6.7 MHz	Lowest	L154	Max.
						23 MHz	Highest	CT154	
						Repeat steps (1) and (2)			
14	(1) (2) (3)	SW 2 ANT. (Tracking)				8 MHz	8 MHz	L151	Max.
						20 MHz	20 MHz	CT151	
						Repeat steps (1) and (2)			
15	(1) (2)	AM IF	● Genescope (455 kHz)	Ferrite-core antenna (Note 5)	TP201	455 kHz	Highest	T201 T203	Note 6
						Repeat step (1)			
16	(1) (2) (3)	MW OSC. (Covering)	● AM signal generator (400 Hz, 30 % Dev.) ● VTVM	Ferrite-core antenna (Note 5)	TP201	515 kHz	Lowest	L155	Max.
						1650 kHz	Highest	CT152	
						Repeat steps (1) and (2)			
17	(1) (2) (3)	MW ANT. (Tracking)				600 kHz	600 kHz	L152	Max.
						1400 kHz	1400 kHz	CT151	
						Repeat steps (1) and (2)			

**Note :**

1. Feed in a weak signal to TP102 from the genescope. Adjust T101 for maximum gain and the waveform indicated in Fig. 6. If the center of the waveform cannot be lined up on the marker, adjust the right/left balance.

Adjust the genescope output so that there is a little noise riding on the leading edge.

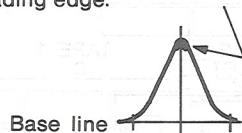


Fig. 6

2. Use the T202 core to form the S-curve shown in Fig. 7. Adjust the symmetry of A and B about point C for linearity.

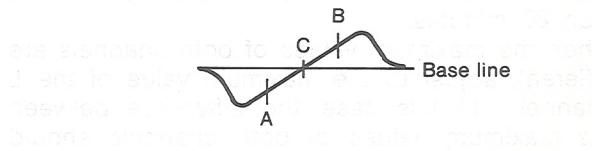


Fig. 7

3. FM dummy antenna is shown in Fig. 8.

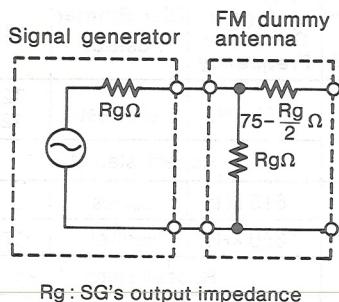
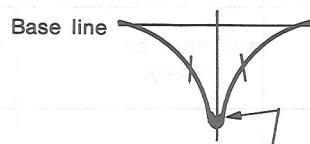


Fig. 8

6. Feed in a weak signal from the genescope. Adjust T201, T203 for maximum gain and the waveform of Fig. 9.



Adjust the genescope output so that there is a little noise riding on the leading edge.

Fig. 9

4. Connect the frequency counter to TP301 and connect a  $100\text{ k}\Omega$  resistor series with the frequency counter.

5. Connect the output of AM signal generator to the loop antenna, and put it near to the ferrite antenna.

7. SW. dummy antenna is shown in Fig. 10

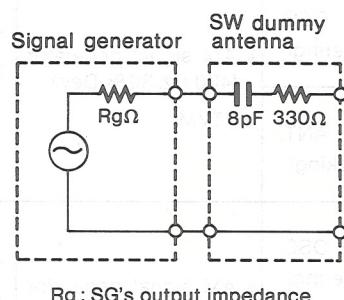


Fig. 10

## 2. Tape Recorder Section

Perform the following adjustments in the sequence stated after cleaning the head, pressure roller, and capstan with a head cleaning stick moistened in alcohol.

Step	Adjustment Item	Measuring Instrument and Connection			Check Tape	Mode	Adjusted Position	Adjusted Value	Remarks
		Measuring Instrument	Input Terminal	Output Terminal					
1	Tape speed	• Frequency counter	—	Speaker terminal	Tape speed adjustment tape (3 kHz)	Playback	Semivariable resistor in the motor P.W.B. (Fig. 11)	$3\text{ kHz} \pm 20\text{ Hz}$	Note 1
2	Head azimuth	• VTVM	—	Speaker terminal	Head azimuth adjustment tape (10 kHz)	Playback	Azimuth adjusting screw	Output max.	Note 2

### Note :

1. Adjust within 30 sec. after heat-running for more than 20 minutes.
2. When the maximum values of both channels are different, adjust to the maximum value of the L channel. In this case, the difference between the maximum values of both channels should be within 2 dB.

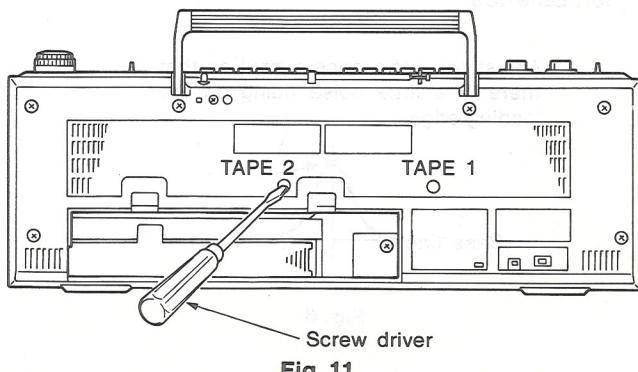
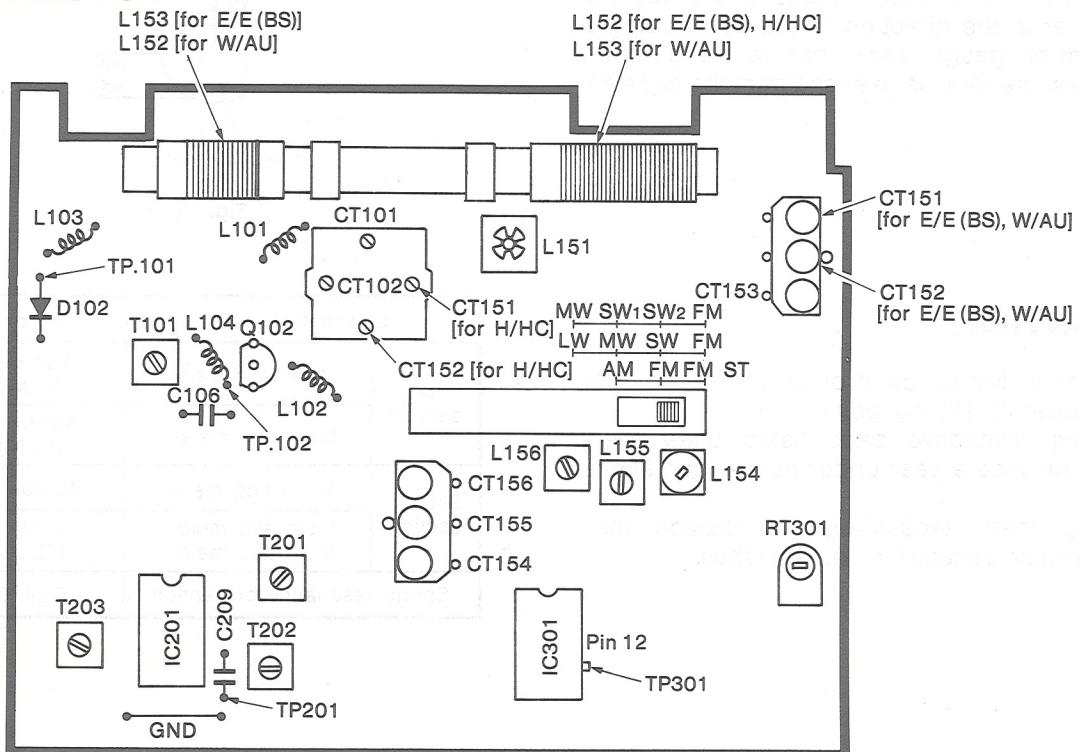


Fig. 11

## ADJUSTMENT PARTS LOCATION

## • TUNER SECTION



## INSPECTION OF MECHANISM

Item	Checking item		Reference value	Remarks
1	Pressure of pressure roller		300–500 g	Note
2	Take-up torque		35–65 g.cm	
3	Fast forward/Rewind torque		60–140 g.cm	TAPE 2
			60–140 g.cm	TAPE 1
4	Auto-Stop sensor operation force		40–75 g	
5	Brake torque		15 g.cm or more	Measured in stop mode
6	Back tension torque	Take-up	2–6.5 g.cm	TAPE 2
			1–6 g.cm	TAPE 1
		Supply	2–6 g.cm	
7	Flywheel thrust gap		0.05–0.5 mm	
8	Button operation force	Play button	1.7 kg or less	
		FF button	1.0 kg or less	
		Rewind button	1.0 kg or less	
		Eject button	1.0 kg or less	
		Record button	1.0 kg or less	
		Pause button	1.5 kg or less	

**Note :**

Set this unit in the playback mode and press the pressure roller in the direction of the arrow using a fan type tension gauge, and measure the pressure when the pressure roller is released from the capstan.

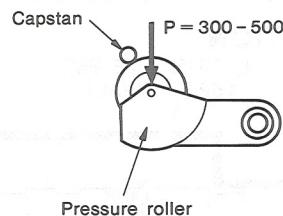


Fig. 12

**LUBRICATION**

Lubricate one or two drops of oil to rotating point or lubricate grease to sliding point.  
 Lubricate the respective parts listed once every 1000 hours or once a year under normal conditions of use.  
 Avoid oiling them excessively, or rotation may become irregular because of oil splashes.

Lubrication point		Oil or Grease
Rotary section	Metal and metal	Pan motor oil (10 W-40)
	Mold and metal	Sonic slider oil (# 1600)
Sliding section	Metal and metal	Hitasol (MO-138)
	Mold and mold	White grease (FL-LUBE-A)
	Mold and metal	Foil (GB-TS-1)
Spring resonance prevention		

**DIAL CORD STRINGING****Stringing method**

- String the dial cord to each rollers according to the order from ① to ⑧ after turned the pulley to the end of clockwise direction.

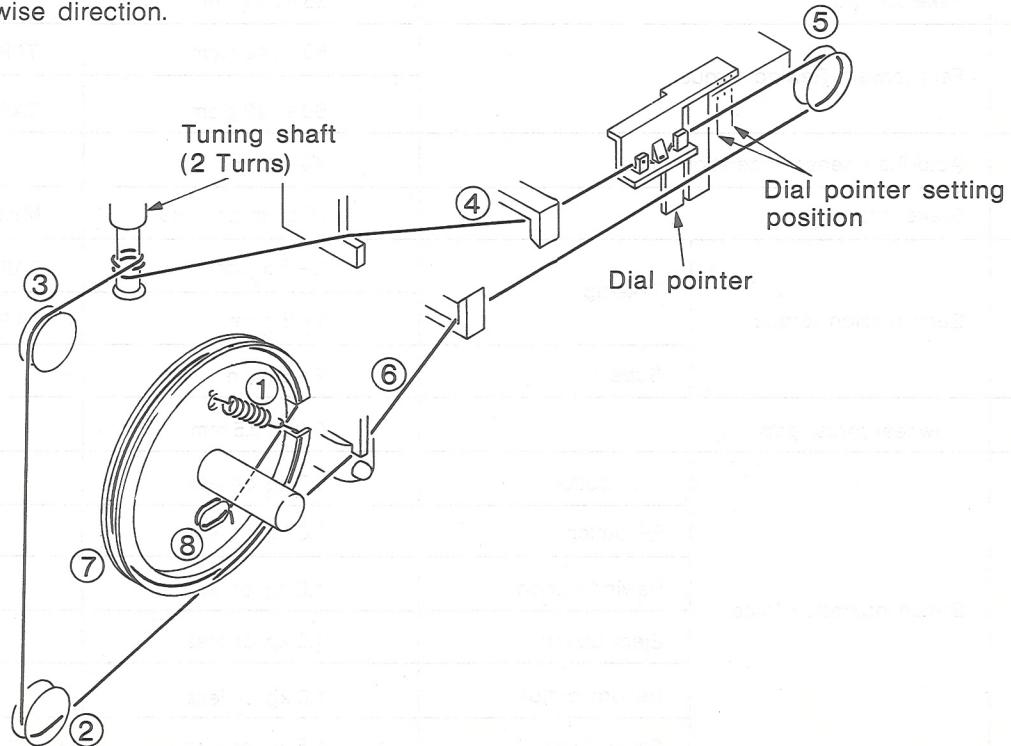


Fig. 13



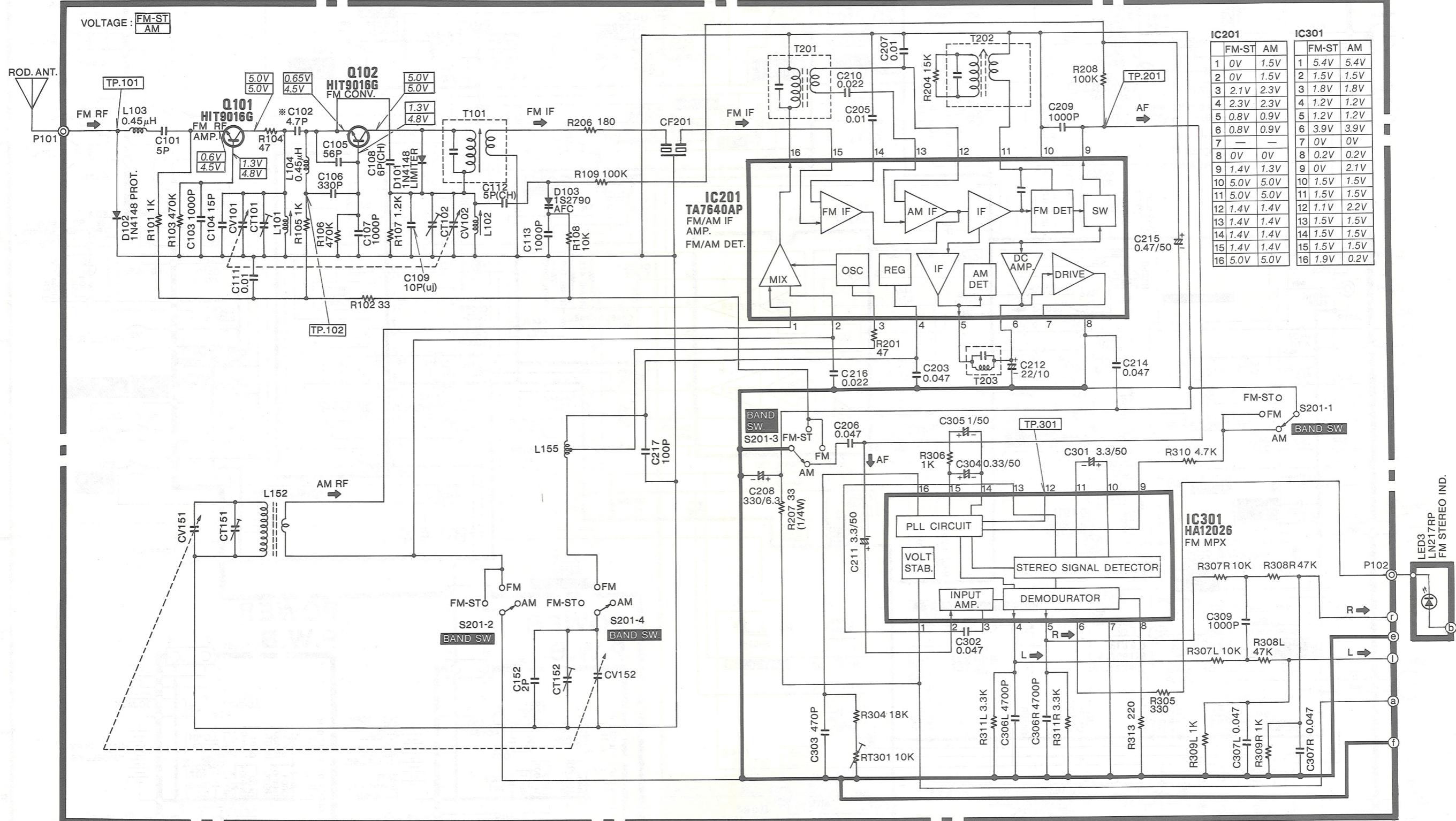
**CIRCUIT DIAGRAM**  
[For H, HC]

## CAUTION

Use the electrolytic capacitors with explosion-proof valve  
when the diameter of them is more than 10mmØ.

\* : Axial lead cylindrical ceramic capacitor

## TUNER P.W.B.



## **CIRCUIT DIAGRAM**

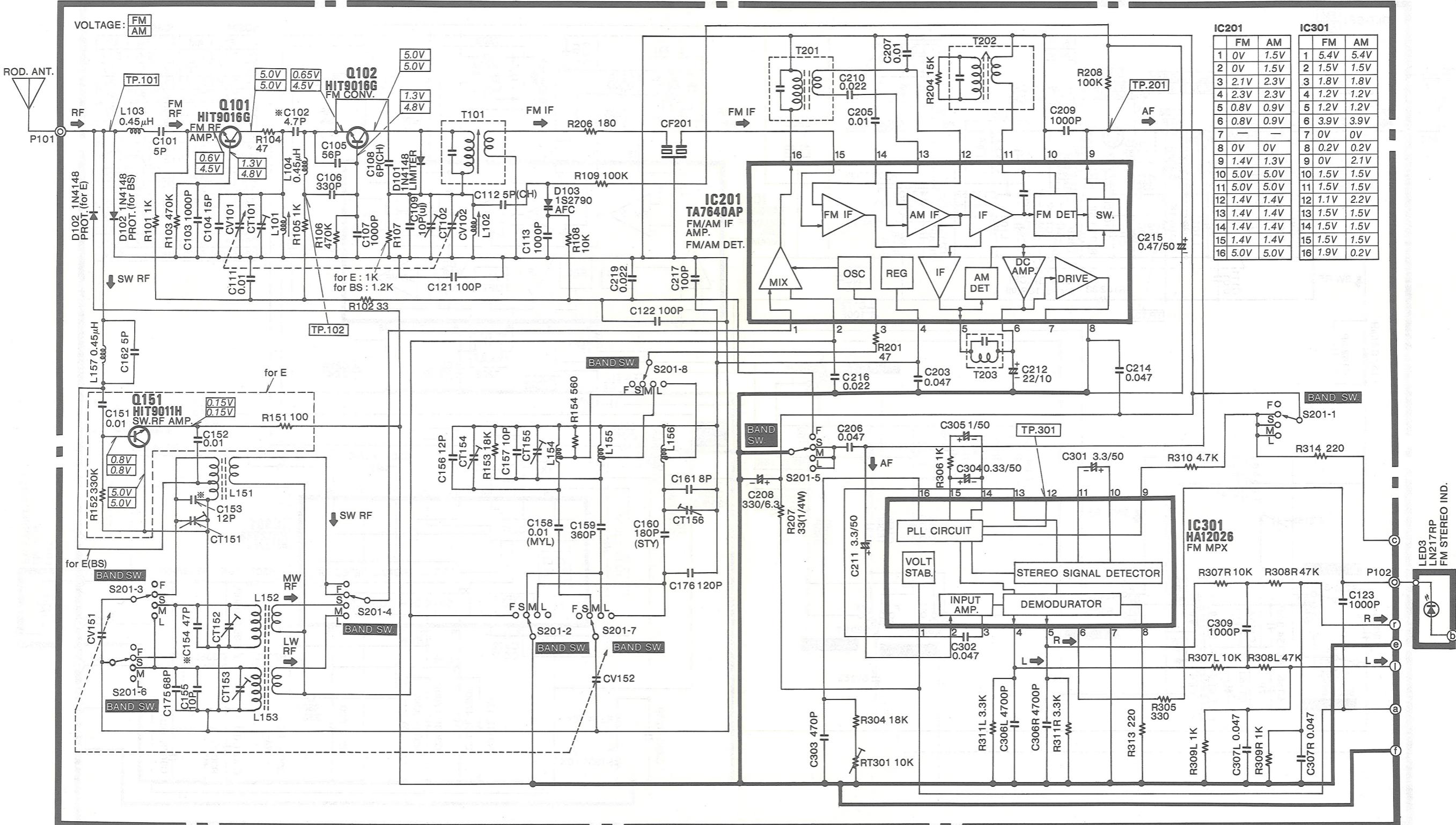
**[For E, E (BS)]**

### CAUTION

Use the electrolytic capacitors with explosion-proof valves when the diameter of them is more than 10mmø.

\* : Axial lead cylindrical ceramic capacitor

## **TUNER P.W.B.**



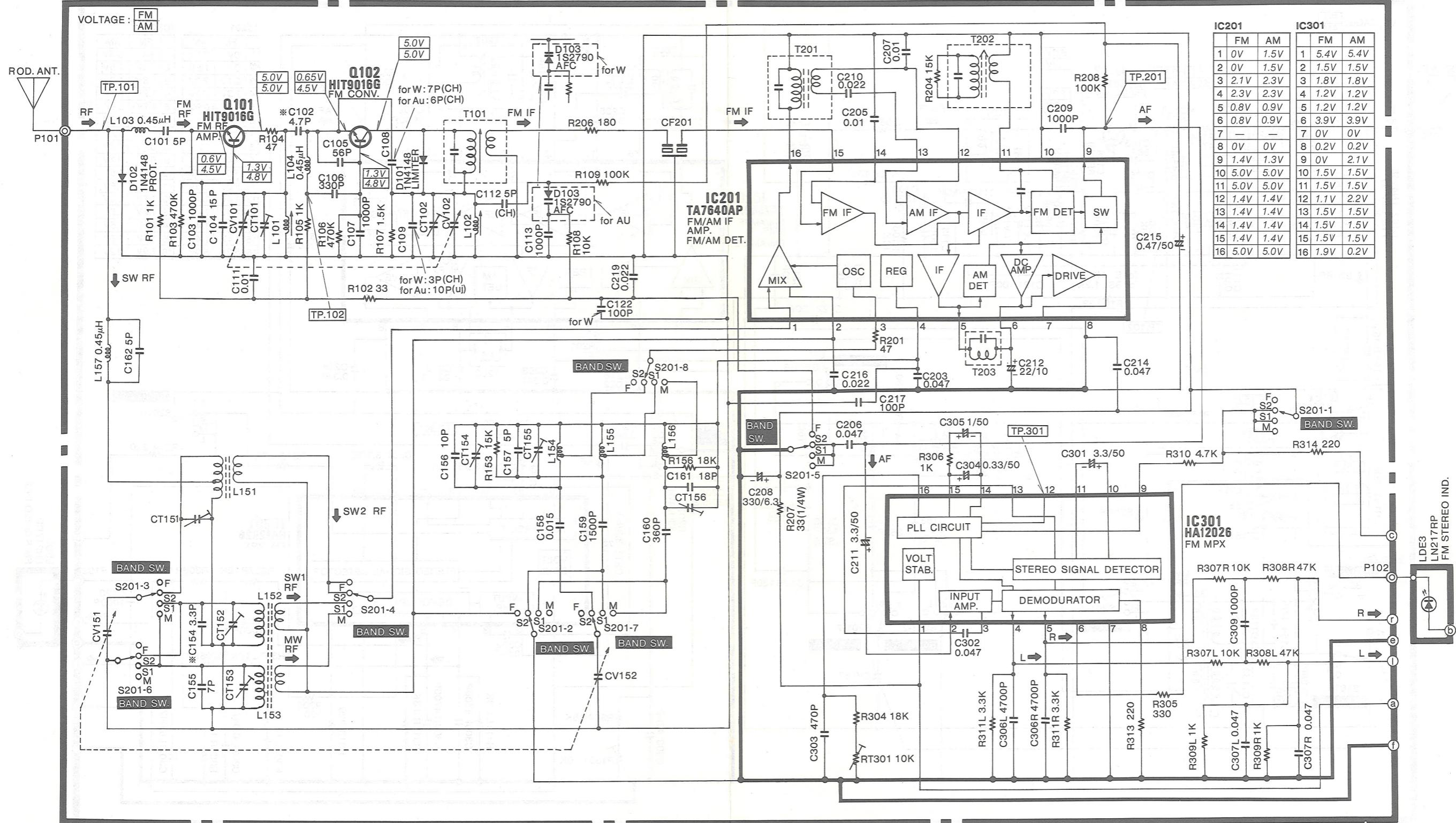
**CIRCUIT DIAGRAM**  
[For W, AU]

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## TUNER P.W.B.

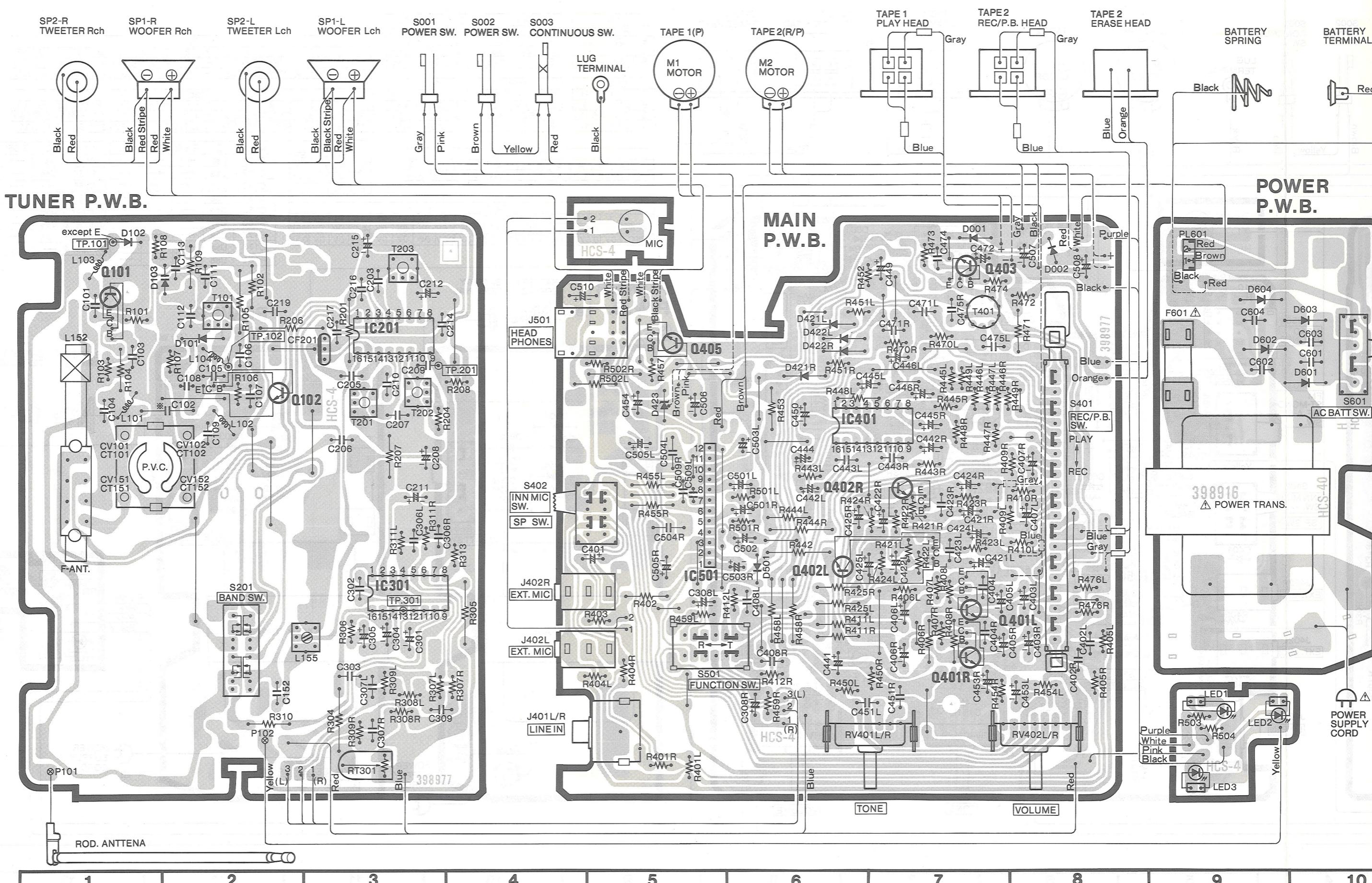


IC201		IC301	
FM	AM	FM	AM
1 0V	1.5V	1 5.4V	5.4V
2 0V	1.5V	2 1.5V	1.5V
3 2.1V	2.3V	3 1.8V	1.8V
4 2.3V	2.3V	4 1.2V	1.2V
5 0.8V	0.9V	5 1.2V	1.2V
6 0.8V	0.9V	6 3.9V	3.9V
7 —	—	7 0V	0V
8 0.2V	0.2V	8 0.2V	0.2V
9 1.4V	1.3V	9 0V	2.1V
10 5.0V	5.0V	10 1.5V	1.5V
11 5.0V	5.0V	11 1.5V	1.5V
12 1.4V	1.4V	12 1.1V	2.2V
13 1.4V	1.4V	13 1.5V	1.5V
14 1.4V	1.4V	14 1.5V	1.5V
15 1.4V	1.4V	15 1.5V	1.5V
16 5.0V	5.0V	16 1.9V	0.2V

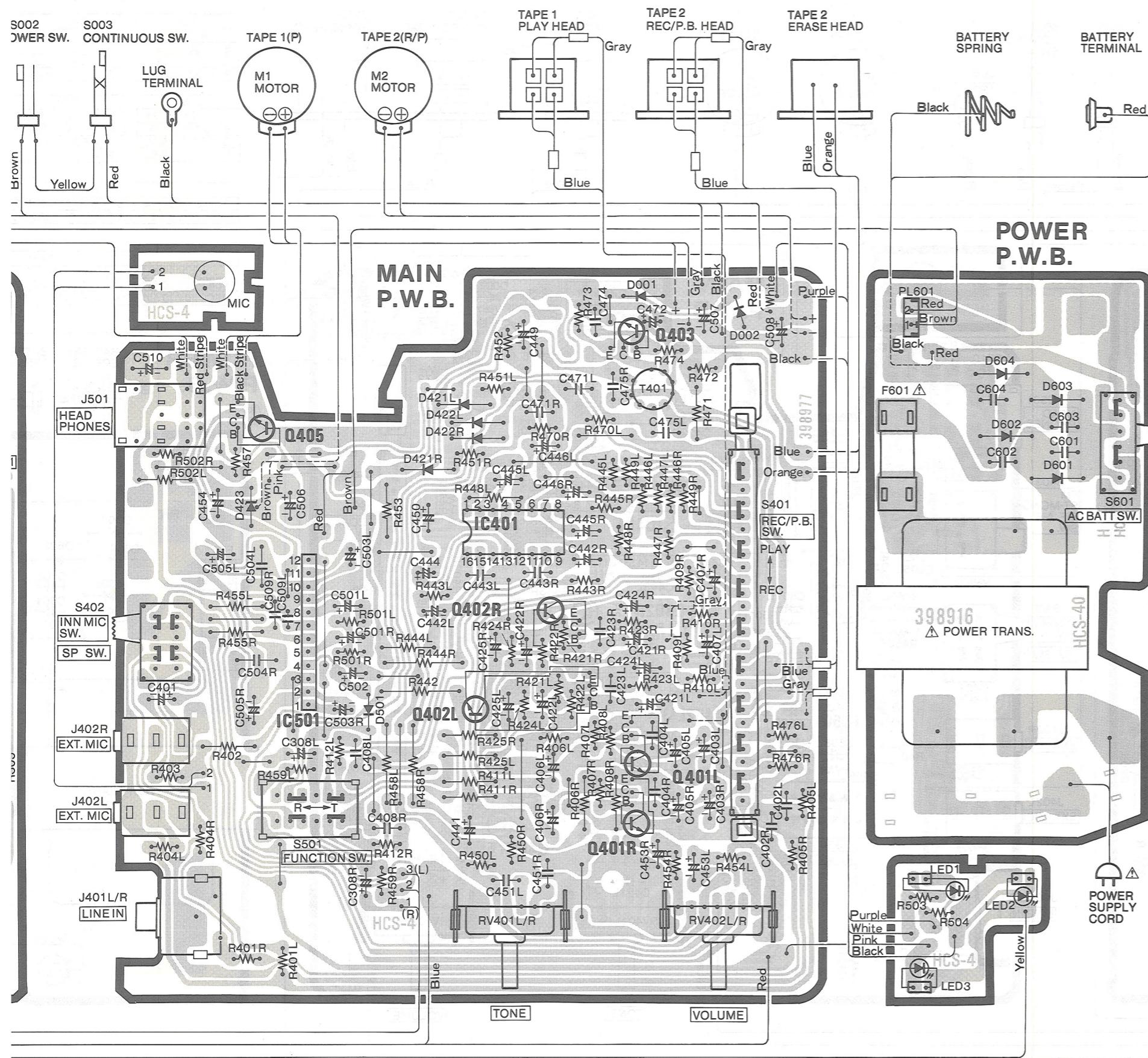
# PRINTED WIRING BOARD

[For H, HC]

\* : Axial lead cylindrical ceramic capacitor



\* : Axial lead cylindrical ceramic capacitor



IC201																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
FM-ST	0V	0V	2.1V	2.3V	0.8V	0.8V	—	0V	1.4V	5.0V	5.0V	1.4V	1.4V	1.4V	1.4V	5.0V
AM	1.5V	1.5V	2.3V	2.3V	0.9V	0.9V	—	0V	1.3V	5.0V	5.0V	1.4V	1.4V	1.4V	1.4V	5.0V

IC301																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
FM-ST	5.4V	1.5V	1.8V	1.2V	1.2V	3.9V	0V	0.2V	0V	1.5V	1.5V	1.1V	1.5V	1.5V	1.5V	1.9V
AM	5.4V	1.5V	1.8V	1.2V	1.2V	3.9V	0V	0.2V	2.1V	1.5V	1.5V	2.2V	1.5V	1.5V	1.5V	0.2V

IC401																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PLAY	OV	0.5V	2.0V	4.7V	OV	2.0V	0.5V	OV	0.5V	OV	OV	OV	4.4V	OV	OV	0.5V
REC	OV	0.5V	2.0V	4.7V	OV	2.0V	0.5V	OV	0.5V	OV	OV	OV	4.4V	OV	OV	0.5V

IC501											
1	2	3	4	5	6	7	8	9	10	11	12
7.2V	4.3V	8.3V	8.2V	0.6V	0V	0V	0.6V	0V	4.2V	7.2V	9.0

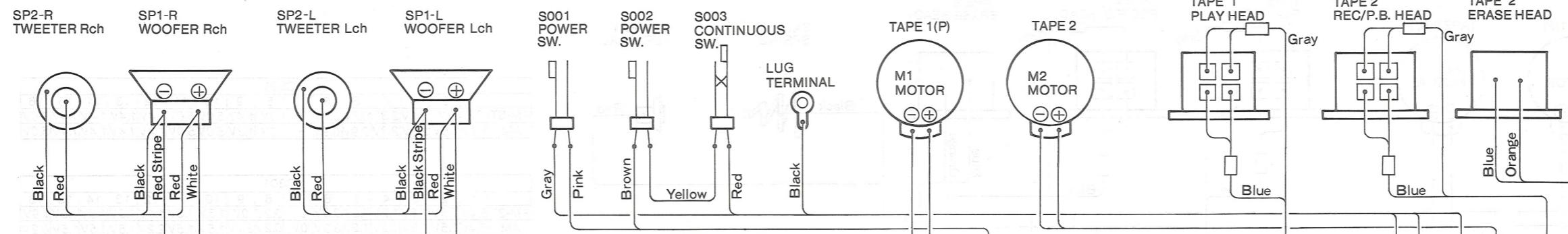
Q101			Q102		
	FM-ST	AM		FM-ST	AM
E	0.6V	4.5V	E	0.65V	4.5V
C	5.0V	5.0V	C	5.0V	5.0V
B	1.3V	4.8V	B	1.3V	4.8V

Q405		Q403		Q401LR, Q402LR				
	PLAY	REC		PLAY	REC		PLAY	REC
E	5.4V	5.4V	E	0V	0.1V	E	0V	0V
C	9.0V	9.0V	C	0V	3.8V	C	1.5V	1.5V
B	6.0V	6.0V	B	0V	0.75V	B	0.65V	0.65V

## PRINTED WIRING BOARD

[Except H, HC]

\*: Axial lead cylindrical ceramic capacitor



Q404	PLAY	REC	Q403	PLAY	REC
E	0V	0V	E	0V	0.1V
C	0V	0V	C	0V	3.8V
B	0V	0V	B	0V	0.75V

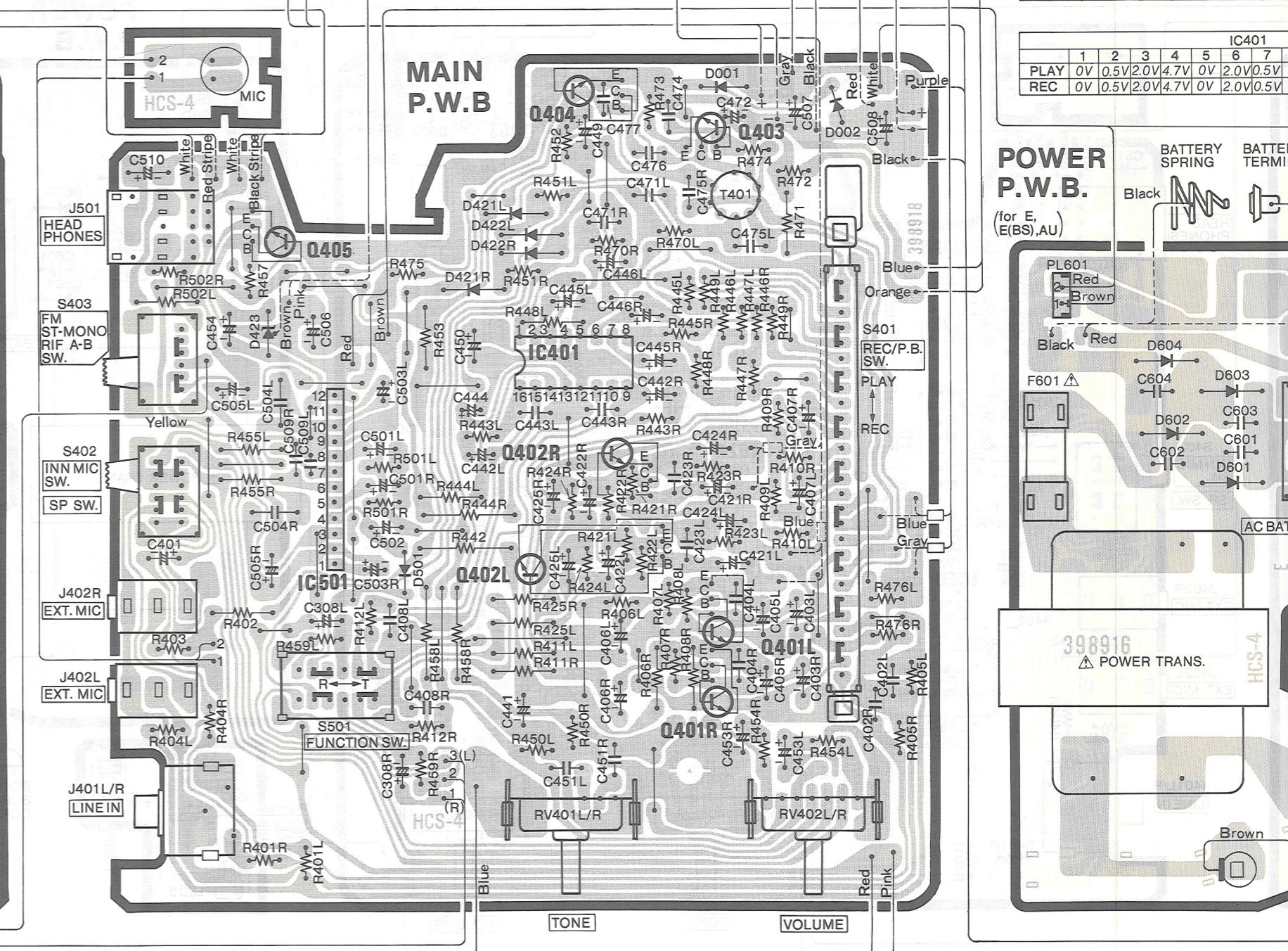
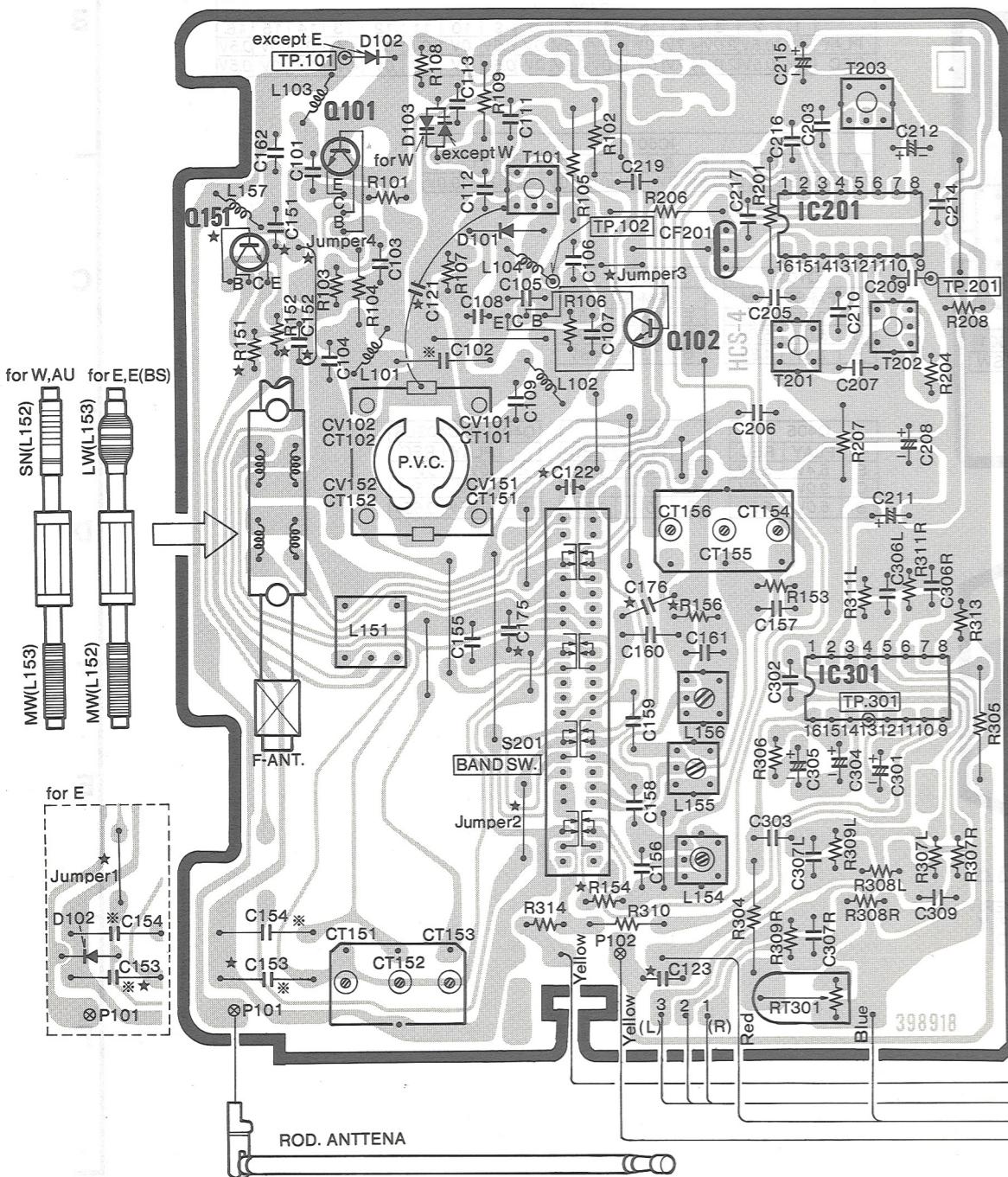
Q151	FM	AM	Q101	FM	AM
E	0.15V	0.15V	E	0.6V	4.5V
C	5.0V	5.0V	C	5.0V	5.0V
B	0.8V	0.8V	B	1.3V	4.8V

IC501	1	2	3	4	5	6	7	8	9
7.2V	4.3V	8.3V	8.2V	0.6V	0V	0V	0.6V	0V	0V

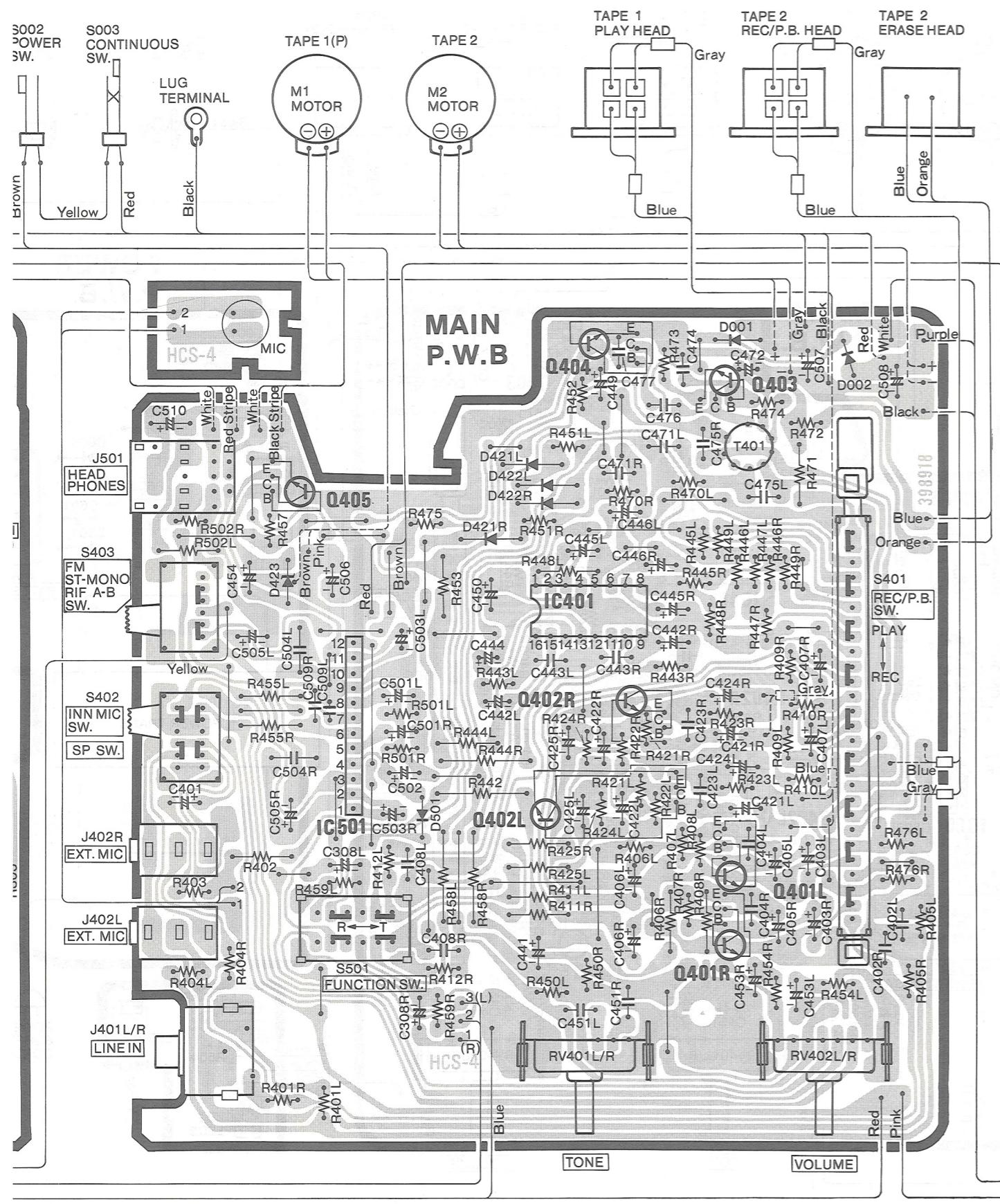
IC401	1	2	3	4	5	6	7	8
PLAY	0V	0.5V	2.0V	4.7V	0V	2.0V	0.5V	C

POWER P.W.B.	BATTERY SPRING	BATTER TERMIN
(for E, E(BS), AU)	Black	Black

## TUNER P.W.B.



\* : Axial lead cylindrical ceramic capacitor



Q404		
	PLAY	REC
E	OV	OV
C	OV	OV
B	OV	OV

Q403		
	PLAY	REC
E	0V	0.1V
C	0V	3.8V
B	0V	0.75V

Q401LR, Q402LR		
	PLAY	REC
E	0V	0V
C	1.5V	1.5V
B	0.65V	0.65V

Q151		
	FM	AM
E	0.15V	0.15V
C	5.0V	5.0V
B	0.8V	0.8V

Q101		
	FM	AM
E	0.6V	4.5V
C	5.0V	5.0V
B	1.3V	4.8V

Q102		
	FM	AM
E	0.65V	4.5V
C	5.0V	5.0V
B	1.3V	4.8V

IC501											
1	2	3	4	5	6	7	8	9	10	11	12
7.2V	4.3V	8.3V	8.2V	0.6V	0V	0V	0.6V	0V	4.2V	7.2V	9.0V

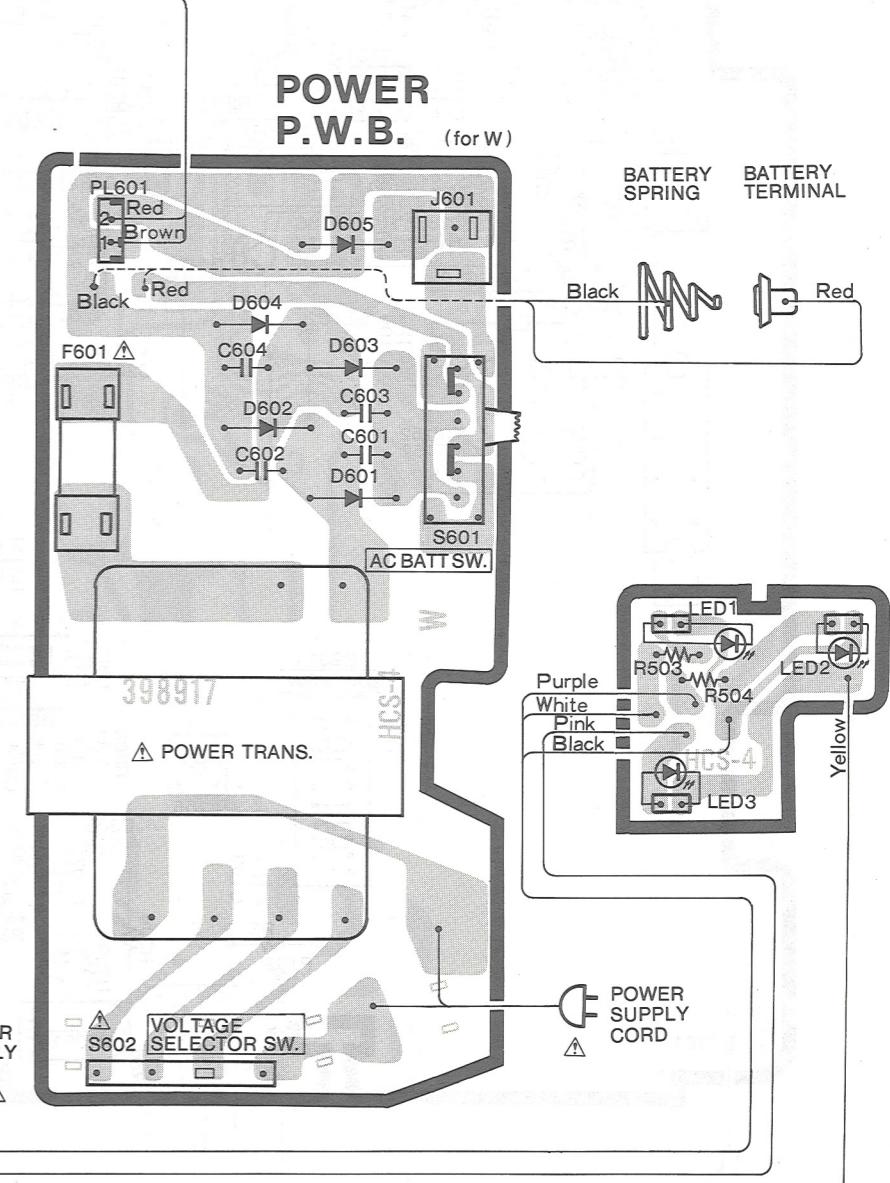
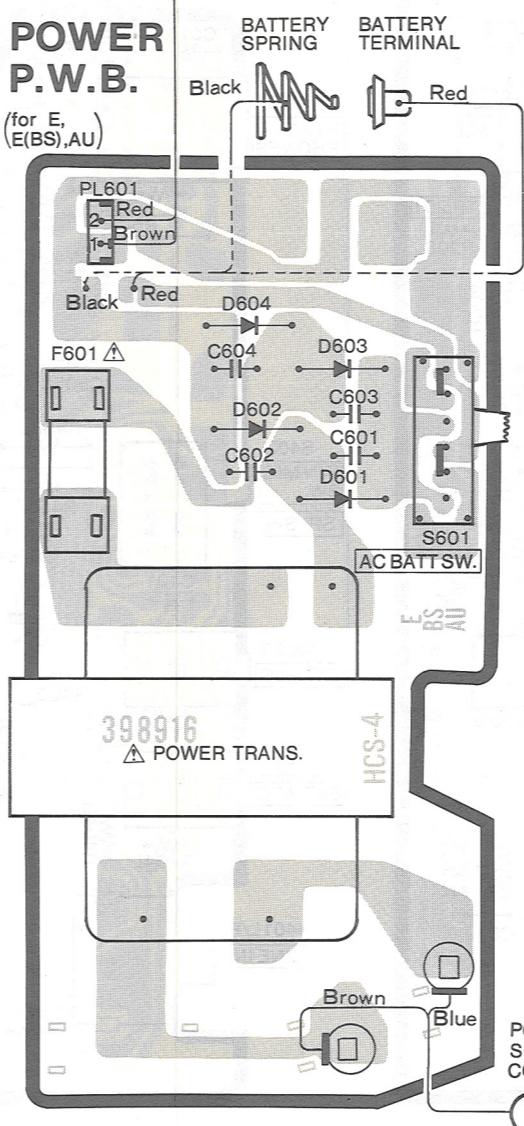
IC401																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PLAY	0V	0.5V	2.0V	4.7V	0V	2.0V	0.5V	0V	0.5V	0V	0V	0V	4.4V	0V	0V	0.5V
REC	0V	0.5V	2.0V	4.7V	0V	2.0V	0.5V	0V	0.5V	0V	0V	0V	4.4V	0V	0V	0.5V

IC201															
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
FM	0V	0V	2.1V	2.3V	0.8V	0.8V	—	0V	1.4V	5.0V	5.0V	1.4V	1.4V	1.4V	5.0V
AM	1.5V	1.5V	2.3V	2.3V	0.9V	0.9V	—	0V	1.3V	5.0V	5.0V	1.4V	1.4V	1.4V	5.0V

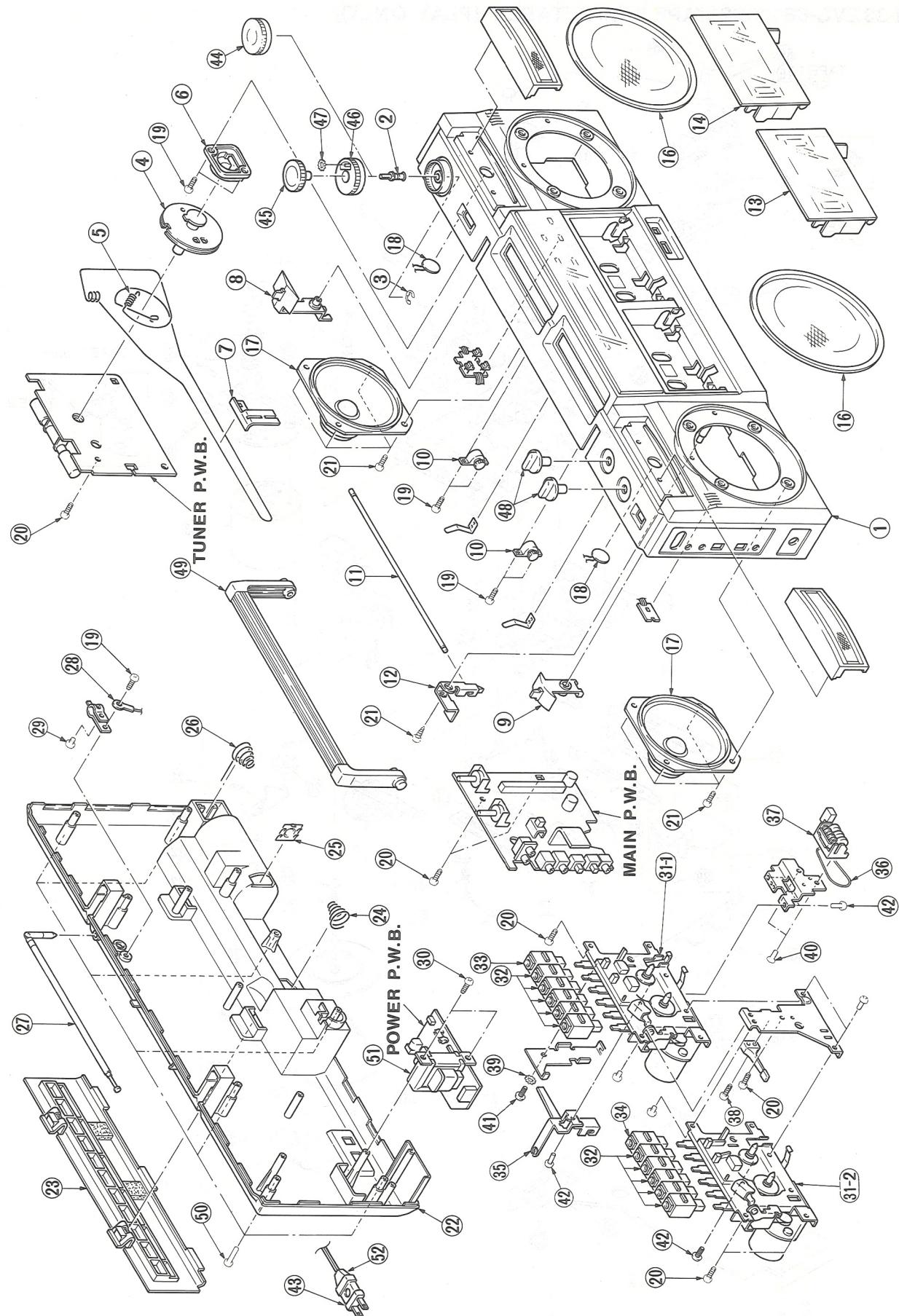
IC301																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
FM	5.4V	1.5V	1.8V	1.2V	1.2V	3.9V	0V	0.2V	0V	1.5V	1.5V	1.1V	1.5V	1.5V	1.5V	1.9V
AM	5.4V	1.5V	1.8V	1.2V	1.2V	3.9V	0V	0.2V	2.1V	1.5V	1.5V	2.2V	1.5V	1.5V	1.5V	0.2V

Q405		
	PLAY	REC
E	5.4V	5.4V
C	9.0V	9.0V

★ No.	E	E(BS)	W	AU	★ No.	E	E(BS)	W	AU
C121	Use	←	—	—	R152	Use	—	—	—
C122	Use	←	←	—	R154	Use	←	—	—
C123	Use	←	—	—	R156	—	—	Use	←
C151	Use	—	—	—	Q151	Use	—	—	—
C152	Use	—	—	—	Jumper 1	Use	—	—	—
C153	Use	←	—	—	Jumper 2	Use	—	—	—
C175	Use	←	—	—	Jumper 3	Use	←	—	—
C176	Use	←	—	—	Jumper 4	—	Use	←	←
R151	Use	—	—	—					

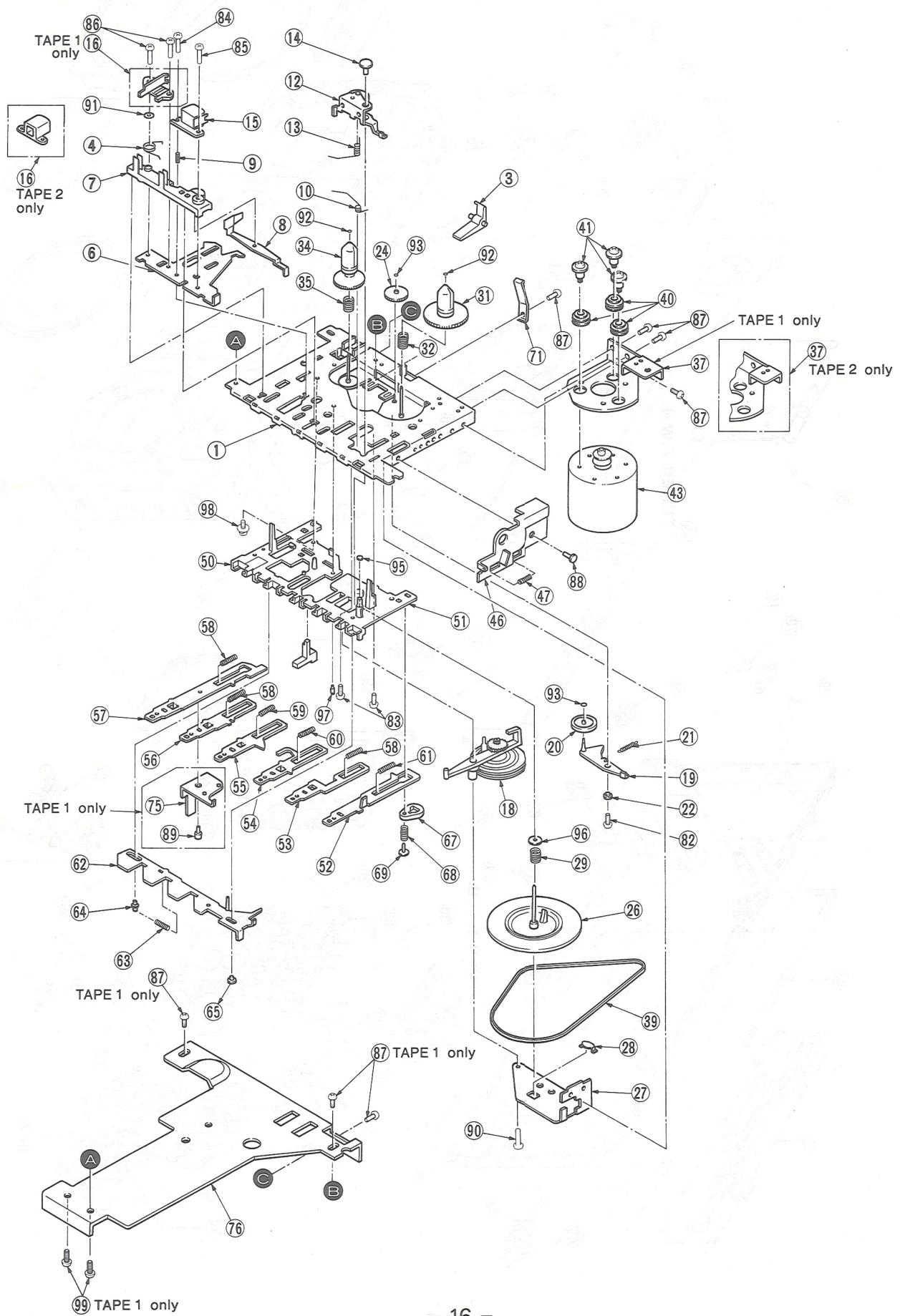


## EXPLODED VIEW (Cabinet)



## EXPLODED VIEW

TN-33ZVC-681/682 [TAPE 2 (R/P)/TAPE 1 (PLAY ONLY)]



## REPLACEMENT PARTS LIST

SYMBOL No.	PART No.	DESCRIPTION	SYMBOL No.	PART No.	DESCRIPTION	SYMBOL No.	PART No.	DESCRIPTION
<b>for FRONT CASE ASSEMBLY</b>								
1	4027421	Front case ass'y [for H, HC]	22	4027451	Rear case ass'y [for H]	38	4582514	2φ × 8 DT screw
	4027422	Front case ass'y [for E, E (BS)]		4027452	Rear case ass'y [for HC]	39	8815113	2.6φ Lock washer
	4027423	Front case ass'y [for W]		4027453	Rear case ass'y [for E]	40	8721406	3φ × 6 Flat head screw
	4027424	Front case ass'y [for AU]		4027454	Rear case ass'y [for E (BS)]	41	0741304	2.6φ × 4 Bind screw
2	4591983	Tuning shaft [for H, HC, E, E (BS)]		4027455	Rear case ass'y [for W]	42	4578282	2.6φ × 5 DT screw (×4)
	4591984	Tuning shaft [for W]		4027456	Rear case ass'y [for W (UN)]			
3	4418013	E ring	23	3973523	Battery lid ass'y			
4	3348602	Pulley	24	3369849	Spring	43	2667922	Siemens plug [for W]
5	3340321	Spring	25	4436666	Terminal	44	3303182	Knob [for H, HC, E, E (BS)]
6	3973081	Pulley holder	26	3369781	BAT spring	45	3303092	Fine knob [for W, AU]
7	3973031	Pointer	27	2758012	Rod antenna	46	3973051	Tuning knob [for W, AU]
8	4442031	Function lever	28	5895282	Rod antenna wire	47	3348611	OG gear [for W, AU]
9	3973061	Knob	29	4592528	3φ × 8 flange head screw	48	3303171	Select knob (×2)
10	3950381	Damper ass'y (×2)	30	4578976	3φ × 20 BT flange head screw (×2)	49	4441859	Handle ass'y
11	4591991	REC shaft				50	4577817	3φ × 30 Bind head screw (×8)
12	4441841	REC lever				▲ 51	2248925	Power trans. [for H, HC]
13	3973093	Cassette lid	31-1	2588501	TN-33 ZVC (TAPE 2)	▲	2248922	Power trans. [for E]
14	3973094	Cassette lid	31-2	2588502	TN-33 ZVC (TAPE 1)	▲	2248923	Power trans. [for E (BS)]
			32	3303163	Cassette button (×10)	▲	2248921	Power trans. [for W]
16	3973511	Speaker grille (×2)	33	3303164	Cassette button	▲	2248924	Power trans. [for AU]
17	2402911	10 Speaker (×2)	34	3303165	Cassette button	▲ 52	2706241	Power supply cord [for H, HC]
18	2403354	Piezo tweeter (×2)	35	4442082	REC arm ass'y		2719449	Power supply cord [for E]
19	8691410	3φ × 10 Bind head screw (×6)	36	4689531	Counter belt		2717902	Power supply cord [for E, (BS)]
20	8699410	3φ × 10 Bind head screw (×7)	37	2788864	Enplas counter		2706264	Power supply cord [for W]
21	4578972	3φ × 10 BT flange head screw (×9)		2789721	Leaf switch (×2)		2706251	Power supply cord [for AU]
				2789711	Leaf switch			

## **TN-33 ZVC-681/682 (TAPE 2/TAPE 1)**

ITEM No.	PART No.	DESCRIPTION	ITEM No.	PART No.	DESCRIPTION	ITEM No.	PART No.	DESCRIPTION
1	4815001	Chassis ass'y	35	4815014	Back tension spring	71	4815034	Pack spring
3	3959031	Record prevention lever (TAPE 2)	37	4815015	Motor bracket (TAPE 2)	75	4441801	Continuous play lever (TAPE 1)
4	4815002	REC spring	37	4451601	Motor bracket (TAPE 1)	76	4441831	Mecha. holder (TAPE 1)
6	4815003	Head panel	39	4690601	Belt	82	8691104	2φ × 4 BT screw
7	3959051	Head base	40	4690591	Motor rubber (×3)	83	8691105	2φ × 5 BT screw (×2)
8	4815004	Sensing plate ass'y	41	4586421	Special screw (×3)	84	8691108	2φ × 8 Bind head screw
9	3365081	Spring for head	43	4816992	Motor ass'y	85	8691108	2φ × 8 Bind head screw
10	4815005	Head panel spring	46	4815016	Eject lever ass'y	86	8691108	2φ × 8 Bind head screw (×2)
12	4815006	Pinch roller ass'y	47	4815017	Eject lever spring	87	4578281	2.6φ × 4 Screw
13	3365101	Spring	50	4815021	Push button base (R)	88	8711305	TAPE 2 (×4), TAPE 1 (×7)
14	3959061	Pressure roller arm stopper	51	4815022	Push button base (L)	89	4578281	2.6φ × 5 Tapping screw
15	2555671	Record playback head	52	4815023	Pause button lever ass'y	90	8691110	2φ × 10 Bind tapping screw
16	2555661	E.H. Head (TAPE 2)	53	4815024	Stop button lever	91	4701927	Washer
16	4813851	Dummy head (TAPE 1)	54	4815025	F.F. button lever	92	4701925	Washer (×2)
18	4815007	RF clutch arm ass'y	55	4815026	RWD button lever	93	4701926	Washer (×2)
19	4815008	Take up roller arm ass'y	56	4815027	Play button lever	95	4701921	Nylon washer
20	4815009	Take up roller ass'y	57	4815028	REC button lever	96	4701924	Nylon washer
21	3365121	Spring (Take up roller arm)	58	3365171	Button lever spring (×3)	97	8691106	2φ × 6 DT screw
22	4586351	Coller (Take up roller arm)	59	3365181	Spring (Button lever)	98	4586481	Coller screw
24	3959111	F.F. gear	60	3365191	Button lever spring	99	4567419	3φ × 5 DT screw (×2)
			61	3365211	Spring (Button lever)			(TAPE 1)
26	4815011	Flywheel ass'y	62	4815031	Push button actuator ass'y			
27	4815012	Flywheel holder	63	3365201	Spring			
28	3959151	Flywheel plate	64	3959221	Actuator shaft			
29	3365131	Spring (Flywheel thrust)	65	3959231	Actuator shaft			
31	4815013	Take up reel ass'y	67	3959271	Pause lever			
32	4815014	Back tension spring (TAPE 1)	68	4815032	Pause lever spring			
32	3365151	Back tension spring (TAPE 2)	69	4815033	Pause lever stopper			
34	3959381	Supply reel ass'y						

## REPLACEMENT PARTS LIST

CD: Ceramic discal  
PP: Polypro-pyleneCC: Cylindrical ceramic  
STY: StyrolEL: Electrolytic  
CF: Carbon film

MF: Mylar, film

H: U.S.A.

HC: Canada

E: Europe (except U.K.)

E (BS): U.K.

AU: Australia

W: Asia &amp; Latin American countries, etc.

SYMBOL No.	PART No.	DESCRIPTION			SYMBOL No.	PART No.	DESCRIPTION			SYMBOL No.	PART No.	DESCRIPTION					
<b>CAPACITORS</b>																	
C101	0208635	CD	5pF	±0.25%	50V	C162	0208635	CD	5pF	±0.25%	50V	C471LR	0209734	CD	3300pF	±10%	50V
C102	0230008	CC	4.7pF	±10%	50V	C175	0208680	CD	68pF	±5%	50V	C472	0252331	EL	100μF	±80%	10V
C103	0209161	CD	1000pF	±20%	50V	C176	0208686	CD	120pF	±5%	50V	C474	0209161	CD	1000pF	±20%	50V
C104	0208664	CD	15pF	±5%	50V			CD	120pF	±5%	50V	C475LR	0274013	MF	2200pF	±10%	50V
C105	0208678	CD	56pF	±5%	50V			CD	120pF	±5%	50V	C476	0275013	MF	0.022μF	±10%	50V
C106	0209721	CD	330pF	±10%	50V			CD	120pF	±5%	50V	C477	0244171	CD	0.01μF	±80%	50V
C107	0209161	CD	1000pF	±20%	50V	C203	0209175	CD	0.047μF	±80%	50V	C501LR	0252325	EL	47μF		10V
C108	0246426	CD	6pF	±0.5%	50V	C205	0244171	CD	0.01μF	±20%	50V	C502	0252531	EL	100μF		16V
	[except W]	CD	7pF	±0.5%	50V	C206	0249765	CD	0.047μF	±20%	50V	C503LR	0252325	EL	47μF		10V
	[for W]	CD	7pF	±0.5%	50V	C207	0244171	CD	0.01μF	±20%	50V	C504LR	0276012	MF	0.15μF	±10%	50V
C109	0248480	CD	10pF	±5%	50V	C208	0252233	EL	330μF		6.3V	C505LR	0252235	EL	470μF		6.3V
	[except W]	CD	10pF	±5%	50V	C209	0209161	CD	1000pF	±20%	50V	C506	0252541	EL	1000μF		16V
C109	0246413	CD	3pF	±0.25%	50V	C210	0244173	CD	0.022μF	±20%	50V	C507	0252532	EL	220μF		16V
	[for W]	CD	3pF	±0.25%	50V	C211	0252813	EL	3.3μF		50V	C508	0252532	EL	220μF		16V
C111	0244171	CD	0.01μF	±20%	50V	C212	0252322	EL	22μF		10V	C509LR	0244161	CD	1000pF	±20%	50V
C112	0246415	CD	5pF	±0.25%	50V	C214	0209175	CD	0.047μF	±20%	50V	C510	0256676	EL	47μF		10V
C113	0209161	CD	1000pF	±20%	50V	C215	0252805	EL	0.47μF		50V	C601	0244171	CD	0.01μF	±20%	50V
C121	0208684	CD	100pF	±5%	50V	C216	0244173	CD	0.022μF	±20%	50V	C604	0244171	CD	0.01μF	±20%	50V
C122	0208684	CD	100pF	±5%	50V	C217	0208684	CD	100pF	±5%	50V						
C123	0209161	CD	1000pF	±20%	50V	C219	0244173	CD	0.022μF	±20%	50V						
	[for E, E (BS)]	CD	1000pF	±20%	50V												
C151	0244171	CD	0.01μF	±20%	50V	C301	0252813	EL	3.3μF		50V	R101	0113615	CF	1kΩ	±5%	SRD1/6P
	[for E]	CD	0.01μF	±20%	50V	C302	0209175	CD	0.047μF	±20%	50V	R102	0113579	CF	33Ω	±5%	SRD1/6P
C152	0244171	CD	0.01μF	±20%	50V	C303	0268444	PP	470pF	±5%	100V	R103	0113679	CF	470kΩ	±5%	SRD1/6P
	[for E, E (BS)]	CD	0.01μF	±20%	50V	C304	0252803	EL	0.33μF		50V	R104	0113583	CF	47Ω	±5%	SRD1/6P
C152	0208632	CD	2pF	±0.25%	50V	C305	0252811	EL	1μF		50V	R105	0113615	CF	1kΩ	±5%	SRD1/6P
	[for H, HC]	CD	2pF	±0.25%	50V	C306LR	0209735	CD	4700pF	±10%	50V	R106	0113679	CF	470kΩ	±5%	SRD1/6P
C153	0230014	CD	12pF	±5%	50V	C307LR	0209765	CD	0.047μF	±20%	50V	R107	0113615	CF	1kΩ	±5%	SRD1/6P
	[for E, E (BS)]	CD	12pF	±5%	50V	C308LR	0252805	EL	0.47μF		50V	R107	0113617	CF	1.2kΩ	±5%	SRD1/6P
C154	0230008	CD	4.7pF	±10%	50V	C309	0209161	CD	1000pF	±20%	50V						
	[for E, E (BS)]	CD	4.7pF	±10%	50V							R107	0113619	CF	1.5kΩ	±5%	SRD1/6P
C154	0230006	CD	3.3pF	±10%	50V	C401	0252805	EL	0.47μF		50V	R108	0113639	CF	10kΩ	±5%	SRD1/6P
	[for W, AU]	CD	3.3pF	±10%	50V	C402LR	0244171	CD	0.01μF	±20%	50V	R109	0113663	CF	100kΩ	±5%	SRD1/6P
C155	0208650	CD	10pF	±0.5%	50V	C403LR	0252802	EL	0.22μF		50V	R151	0113591	CF	100Ω	±5%	SRD1/6P
	[for E, E (BS)]	CD	10pF	±0.5%	50V	C404LR	0209163	CD	2200pF	±20%	50V	R152	0113675	CF	330kΩ	±5%	SRD1/6P
C155	0208647	CD	7pF	±0.5%	50V	C405LR	0252803	EL	0.33μF		50V						
	[for W, AU]	CD	7pF	±0.5%	50V	C406LR	0252803	EL	0.33μF		50V	R153	0113645	CF	18kΩ	±5%	SRD1/6P
C156	0208662	CD	12pF	±5%	50V	C407LR	0252803	EL	0.33μF		50V						
	[for E, E (BS)]	CD	12pF	±5%	50V	C408L	0249765	CD	0.047μF	±20%	50V	R153	0113643	CF	15kΩ	±5%	SRD1/6P
C156	0208650	CD	10pF	±0.5%	50V	C408R	0209765	CD	0.047μF	±20%	50V						
	[for W, AU]	CD	10pF	±0.5%	50V	C421LR	0252802	EL	0.22μF		50V	R154	0113609	CF	560Ω	±5%	SRD1/6P
C157	0208650	CD	10pF	±0.5%	50V	C422LR	0252803	EL	0.33μF		50V						
	[for E, E (BS)]	CD	10pF	±0.5%	50V	C423LR	0209163	CD	2200pF	±20%	50V	R155	0113645	CF	18kΩ	±5%	SRD1/6P
C157	0208635	CD	5pF	±0.25%	50V	C424LR	0252803	EL	0.33μF		50V						
	[for W, AU]	CD	5pF	±0.25%	50V	C425LR	0252803	EL	0.33μF		50V						
C158	0275011	MF	0.01μF	±10%	50V	C441	0252232	EL	220μF		6.3V	R201	0113583	CF	47Ω	±5%	SRD1/6P
	[for E, E (BS)]	MF	0.01μF	±10%	50V	C442LR	0252521	EL	10μF		16V	R204	0113643	CF	15kΩ	±5%	SRD1/6P
C158	0275012	MF	0.015μF	±10%	50V	C443LR	0209161	CD	1000pF	±20%	50V	R206	0113597	CF	180Ω	±5%	SRD1/6P
	[for W, AU]	MF	0.015μF	±10%	50V	C444	0252333	EL	33μF		10V	R207	0129543	CF	33Ω	±5%	SRD1/4P
C159	0268321	PP	360pF	±5%	100V	C445LR	0252325	EL	47μF		10V	R208	0113663	CF	100kΩ	±5%	SRD1/6P
	[for E, E (BS)]	PP	360pF	±5%	100V	C446LR	0252323	EL	33μF		10V	R304	0113645	CF	18kΩ	±5%	SRD1/6P
C159	0268442	PP	1500pF	±5%	100V	C449	0252331	EL	100μF		10V	R305	0113603	CF	330Ω	±5%	SRD1/6P
	[for W, AU]	PP	1500pF	±5%	100V	C450	0252232	EL	220μF		6.3V	R306	0113615	CF	1kΩ	±5%	SRD1/6P
C160	0221317	STY	180pF	±5%	50V	C451LR	0209764	CD	0.033μF	±20%	50V	R307LR	0113639	CF	10kΩ	±5%	SRD1/6P
	[for E, E (BS)]	STY	180pF	±5%	50V	C453LR	0252804	EL	0.15μF		50V	R308LR	0113655	CF	47kΩ	±5%	SRD1/6P
C160	0268321	PP	360pF	±5%	100V	C454	0252335	EL	470μF		10V						
	[for W, AU]	PP	360pF	±5%	100V												
C161	0208648	CD	8pF	±0.5%	50V												
	[for E, E (BS)]	CD	8pF	±0.5%	50V												
C161	0208666	CD	18pF	±5%	50V												
	[for W, AU]	CD	18pF	±5%	50V												

SYMBOL No.	PART No.	DESCRIPTION				SYMBOL No.	PART No.	DESCRIPTION				SYMBOL No.	PART No.	DESCRIPTION								
R309LR	0113615	CF	1kΩ	±5%	SRD1/6P	Q401LR	2319091	HIT9014N (C)				CF201	2135321	Ceramic filter 10.7								
R310	0113631	CF	4.7kΩ	±5%	SRD1/6P	Q402LR	2319091	HIT9014N (C)				CV101	0282193	Variable capacitor [for H, HC]								
R311LR	0113627	CF	3.3kΩ	±5%	SRD1/6P	Q403	2319101	2SC1684R				CV101	0282182	Variable capacitor [except H, HC]								
R313	0113599	CF	220Ω	±5%	SRD1/6P	Q404	2319052	HIT8050C [except H, HC]				CV102	0282193	Variable capacitor [for H, HC]								
R314	0113599	CF	220Ω	±5%	SRD1/6P	Q405	2319062	HIT5609C				CV102	0282182	Variable capacitor [except H, HC]								
DIODES																						
R401LR	0113675	CF	330kΩ	±5%	SRD1/6P	D001	2398081	1N4148				CV151	0282193	Variable capacitor [for H, HC]								
R402	0113631	CF	4.7kΩ	±5%	SRD1/6P	D002	2398081	1N4148				CV151	0282182	Variable capacitor [except H, HC]								
R403	0113615	CF	1kΩ	±5%	SRD1/6P	D101	2398082	1N4148				CV152	0282193	Variable capacitor [for H, HC]								
R404LR	0113613	CF	820Ω	±5%	SRD1/6P	D102	2398082	1N4148				CV152	0282182	Variable capacitor [except H, HC]								
R405LR	0113607	CF	470Ω	±5%	SRD1/6P	D103	2338031	1S2790				CT101	0282193	Variable capacitor [for H, HC]								
R406LR	0113633	CF	5.6kΩ	±5%	SRD1/6P	D421LR	2398082	1N4148				CT101	0282182	Variable capacitor [except H, HC]								
R407LR	0113679	CF	470kΩ	±5%	SRD1/6P	D422LR	2398082	1N4148				CT102	0282193	Variable capacitor [for H, HC]								
R408LR	0113581	CF	39Ω	±5%	SRD1/6P	D423	2338003	HZ6C				CT102	0282182	Variable capacitor [except H, HC]								
R409LR	0113605	CF	390Ω	±5%	SRD1/6P	D501	2398081	1N4148				CT151	0282193	Variable capacitor [for H, HC]								
R410LR	0113611	CF	680Ω	±5%	SRD1/6P	D601	2398062	1N4001				CT152	0282193	Variable capacitor [for H, HC]								
R411LR	0113637	CF	8.2kΩ	±5%	SRD1/6P	⋮	⋮	⋮				CT151	0283130	Semi variable capacitor [except H, HC]								
R412LR	0113637	CF	8.2kΩ	±5%	SRD1/6P	D604	2398062	1N4001				CT156	0283130	Semi variable capacitor [except H, HC]								
R412LR	0113679	CF	470kΩ	±5%	SRD1/6P	D605	2398062	1N4001 [for W]				RT301	0199331	Semi variable resistor FM MPX adj.								
R421LR	0113633	CF	5.6kΩ	±5%	SRD1/6P	COILS & TRANSFORMERS																
R422LR	0113633	CF	5.6kΩ	±5%	SRD1/6P	L101	2137683	FM RF coil				LED1	2397753	LN217RP								
R423LR	0113581	CF	39Ω	±5%	SRD1/6P	L102	2137682	FM OSC coil [except W]				LED2	2397753	LN217RP								
R424LR	0113605	CF	390Ω	±5%	SRD1/6P	L102	2137681	FM OSC coil [for W]				LED3	2397753	LN217RP								
R425LR	0113637	CF	8.2kΩ	±5%	SRD1/6P	L103	2137684	Choke coil (0.45μH)				S001	2789721	Leaf switch (POWER SW.)								
R442	0113603	CF	330Ω	±5%	SRD1/6P	L104	2137684	Choke coil (0.45μH)				S002	2789721	Leaf switch (POWER SW.)								
R443LR	0113623	CF	2.2kΩ	±5%	SRD1/6P	L151	2137661	SW ANT coil [for E (BS)]				S003	2789711	Leaf switch (CONTINUOUS SW.)								
R444LR	0113631	CF	4.7kΩ	±5%	SRD1/6P	L151	2137662	SW ANT coil [for E]				S201	2629282	Slide switch (BAND SW.) [except H, HC]								
R445LR	0113667	CF	150kΩ	±5%	SRD1/6P	L151	2137663	SW ANT coil [for W, AU]				S201	2629271	Slide switch (BAND SW.) [for H, HC]								
R446LR	0113659	CF	68kΩ	±5%	SRD1/6P	L152	2758002	Ferrite antenna [for H, HC]				S401	2629291	Slide switch (REC/P.B. SW.)								
R447LR	0113659	CF	68kΩ	±5%	SRD1/6P	L152	2757992	Ferrite antenna [for E, E (BS)]				S402	2628341	Slide switch (INN MIC, SP SW.)								
R448LR	0113589	CF	82Ω	±5%	SRD1/6P	L152	2757981	Ferrite antenna [for W, AU]				S403	2628342	Slide switch (FM ST-MONO, RIF A-B SW.) [except H, HC]								
R449LR	0113665	CF	120kΩ	±5%	SRD1/6P	L153	2757992	Ferrite antenna [for E (BS)]				S501	2629301	Slide switch (FUNCTION SW.)								
R450LR	0113639	CF	10kΩ	±5%	SRD1/6P	L153	2757981	Ferrite antenna [for W, AU]				S601	2629261	Slide switch (AC BATTERY)								
R451LR	0113591	CF	100Ω	±5%	SRD1/6P	L154	2137671	SW OSC coil [for E, E (BS)]				△ S602	2618471	VOL switch (VOLTAGE SELECTOR) [for W]								
R452	0113663	CF	100kΩ	±5%	SRD1/6P	L154	2137672	SW OSC coil [for W, AU]				△ F601	2728073	Fuse T1.25A [except H, HC]								
R453	0129561	CF	100Ω	±5%	SRD1/4P	L155	2137631	MW OSC coil [for E, E (BS)]				△ F601	2728062	UL Fuse 1.25A [for H, HC]								
R454LR	0113625	CF	2.7kΩ	±5%	SRD1/6P	L155	2137634	MW OSC coil [for H, HC]				△	2727832	Fuse holder								
R455LR	0113615	CF	1kΩ	±5%	SRD1/6P	L155	2137633	SW OSC coil [for W, AU]				J401LR	2678151	Pin Jack								
R457	0113615	CF	1kΩ	±5%	SRD1/6P	L156	2137642	LW OSC coil [for E, E (BS)]				J402LR	2679371	3.5 Jack								
R458LR	0113655	CF	47kΩ	±5%	SRD1/6P	L156	2137631	MW OSC coil [for W, AU]				J601	2678282	DC Jack [for W]								
R459LR	0113623	CF	2.2kΩ	±5%	SRD1/6P	L157	2137684	Choke coil [except H, HC] (0.45μH)				J501	2678234	Headphone Jack								
R470LR	0113639	CF	10kΩ	±5%	SRD1/6P	T101	2154962	FM IF trans.				2737441		Mic								
R471	0129551	CF	68Ω	±5%	SRD1/4P	T201	2154952	AM IF trans.														
R472	0113595	CF	270Ω	±5%	SRD1/6P	T202	2154964	FM IF trans.														
R473	0113563	CF	6.8Ω	±5%	SRD1/6P	T203	2154951	AM IF trans.														
R474	0113655	CF	47kΩ	±5%	SRD1/6P	T401	2137651	REC OSC trans.														
R475	0113615	CF	1kΩ	±5%	SRD1/6P	VARIABLE RESISTORS																
R476LR	0113663	CF	100kΩ	±5%	SRD1/6P	RV401LR	0166931	10K-(A) TONE														
R501LR	0113595	CF	150Ω	±5%	SRD1/6P	RV402LR	0166943	10K-(3B) VOLUME														
IC201	2389511	TA7640AP																				
IC301	2389501	HA12026																				
IC401	2369501	BA343																				
IC501	2300021	TA7282AP																				
Q101	2319071	HIT9016G																				
Q102	2319071	HIT9016G																				
Q151	2319081	HIT9011H [for E]																				



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